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ABSTRACT

Belen Public Schools (New Mexico) received a Goals 2000 grant for teacher education and technology integration. The Belen Goals 2000 professional development project established two three-day teachers-teaching-teachers workshops. The first focused on using an integrated software package and the second focused on using e-mail and the Internet. Workshops de-emphasized the mechanics of technology and concentrated on integrating technology within the curriculum. They were structured to engage attendees in model lessons, with attendees becoming content-area learners while also learning about technology integration. In order to assess the level of teacher concerns related to the integration of technology as a change or innovation, the Stages of Concern About the Innovation Questionnaire (SoCQ) was administered to participants. The instrument was based on a seven stage developmental model: awareness, information, personal, management, consequence, collaboration, and refocusing. Findings indicated that the workshops changed teachers in subtle and emerging ways; yet this data points only in the direction of change, not toward substantial or deep changes in educational practices. (AEF)

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Teachers Teaching Teachers: The Belen Goals 2000 Professional Development Project

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In a 1995 comprehensive nationwide assessment, the U. S. Congress Office of Technology Assessment (OTA) indicated that, in the process of acquiring hardware and software for students to use, teachers who are perhaps the most valuable part of the education equation are often overlooked. The CEO Forum (1997), for example, reported that of the total dollars spent for technology in schools only 6 percent of those dollars were spent on teacher education. In New Mexico, only 4 percent of technology monies have been slated for professional development (Bingaman, 1997) despite the OTA's recommendation of 30 percent. Seeking assistance to address teacher education needs, Belen Public Schools in Belen, New Mexico submitted a Goals 2000 grant proposal to secure funding for teacher education and technology integration. The grant was awarded for the 1996-97 school year. This paper presents a description of the Belen Goals 2000 Professional Development Project and evaluation data relevant to that project.

A Framework for Professional Development

Designing professional development for an information age means moving away from the traditional model of one size fits all, inadequate opportunity to practice new skills, and little ongoing support (Fulton, 1996; Grant, 1996). Research on professional development suggests that teachers learn best and are more likely to incorporate new approaches into their teaching when they can experiment and reflect in a safe setting. Teachers must have ample opportunity to discuss and collaborate with their peers and instructors (Fulton, 1996; Grant, 1996; Yocam, 1996). Professional development must help teachers "move beyond 'mechanical use' of curriculum and technology to become facilitators of inquiry" (Grant, 1996, p. 1).

> Research says that professional development has to be directly connected to daily work with students, related to content areas, organized around real problems of practice instead of abstractions, continuous and ongoing, and able to provide teachers with access to outside resources and expertise .... Teachers have to practice change and continually work with others on debugging the problems they encounter (Darling-Hammond, 1997, p. 5).

In an effort to support teachers new to technology integration, a number of schools have paired novice and experienced teachers in an approach referred to as mentoring. Key features of the mentoring approach are that assistance is provided within the context of a personal relationship and focused on the needs of the novice user (MacArthur, et. al., 1993). Since teacher/presenters understand classroom culture and the demands of teaching, their guidance is often more relevant and credible to other teachers. Familiar with the regular work in classrooms, these teacher/presenters can help teacher/participants see how technologies can enrich and support learning (Grant, 1996). Teacher/presenters can also play an invaluable role in generating ideas and problem solving with their peers.

Implementing the Project

The Belen Goals 2000 professional development project established workshops designed to facilitate teachers supporting teachers to integrate technology. The workshops were designed to provide opportunities for 48 Belen teachers (a) to experience excellent models of technology integration and (b) to think systematically about the translation of those models into their own classrooms.

Upon notification of the award of the Goals 2000 grant, the original grant writing committee selected Dr. Priscilla Norton as outside facilitator. In addition to the outside facilitator, the grant made provisions for a district-wide inservice program for 48 of the districts 250 teachers, providing money for substitute teachers and stipends. Once a district teacher-training lab with 12 Internet-linked computers existed, the committee met with Dr. Norton to discuss the process of implementing the professional development component of the project.

The committee agreed that a teachers-teaching-teachers model would be implemented. Dr. Norton would design two

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three-day workshops; the first workshop would focus on using an integrated software package and the second workshop would focus on using email and the Internet. The committee also agreed to invite all district teachers to participate in the Goals 2000 project, and that 12 facilitators and 36 participants would be selected from those who applied. The teachers selected to participate would be divided into four groups of twelve. One group of twelve would comprise those whose application reflected their desire to participate and their willingness to teach others what they had learned; three groups of twelve each would be designated as participants. The committee decided that the first series of workshops would be presented during February using substitute teachers, and the second series of workshops during the last two weeks of July and the first week of August with stipends given to all attendees. Dr. Norton would conduct each workshop with the facilitators and then selected facilitators would replicate the workshop with the remaining three groups of twelve participants.

The twelve facilitators ranged in age from 26 to 55 years and the majority (90%) was female. Fifty percent were elementary level teachers and the remaining secondary group taught history, Title 1, math, and English. They had an average of 14.8 years of experience. The thirty-six participants ranged in age from 26 to 55 years of age, and the majority (85%) was female. Fifty-eight percent were elementary level teachers and remaining secondary group (42%) taught social studies, Title 1, science, math, special education, and Language Arts. They had an average of 11.4 years of exprience.

Workshops de-emphasized the mechanics of technology and focused on integrating technology with the curriculum. They were structured to engage attendees in model lessons, with attendees becoming content-area learners while also learning about integrating technology. Ample opportunities were built into the structure of each workshop for drawing lessons from their own experiences that might be generalized to their own practice. Each workshop ended with attendees designing a lesson they could use in their own practice.

The February workshop asked attendees to become political activists and prepare a proposal and presentation that would help the workshop leader identify the perfect presidential candidate for educators. Attendees were given a model to use in the preparation of their proposal. Their final proposal had to include a logo and name for their consulting firm. It needed to include the construction, administration, and analysis of a survey. Attendees were assisted in using a word processor to prepare their survey, a spreadsheet for analyzing the results, and a word processor and graphs constructed with the spreadsheet to present a political platform for their candidate. Attendees used a presidential database to identify six historic attributes of an electable president (i.e. the average president is between 50 and 60 years of age). They were asked to create a potential classified advertisement to locate the perfect candidate using these attributes. They were asked to create a slogan for their perfect candidate and prepare either a bumper sticker or poster using the graphics program. Final proposals were spiral bound and presented to the class. The afternoon of the third day was reserved for participants to divide into grade level groups and create a lesson plan modeled on their workshop experience.

The summer workshop introduced attendees to the district's email system and the Internet. Using email accounts established prior to the workshops, the workshop leader made a short presentation on using Pine and then introduced an email version of the game of *Clue*. Next, in small groups, attendees used a list of six URL's to construct a rubric for judging the validity and reliability of an Internet site. Rubrics were shared with the large group. Third, attendees were asked to write down three things about which they would like to learn more. Internet search engines were introduced, and attendees located sites related to their list. On the second day, attendees completed a short WebQuest (Dodge, 1995) using the Internet to research a trip to a Spanish speaking country of their choice and write a letter to their rich uncle. Once again, students divided into grade level groups and created a WebQuest for their own students.

Assessing the Project

Teacher Concerns about Technology

In order to assess the level of teacher concerns related to the integration of technology as a change or innovation, the Stages of Concern About the Innovation Questionnaire (SoCQ) was administered. The SoCQ sought to identify changes in teacher concerns about technology and was administered just before the first workshop and just after the last workshop. The instrument is based on a seven stage developmental model: (0) awareness; (1) information; (2) personal; (3) management; (4) consequence; (5) collaboration; and (6) refocusing (Hall, George, and Rutherford, 1979). The SoCQ consists of thirty-five questions each designed to reflect concerns relevant to one of the seven stages of the model. Respondents rate the degree to which each item reflects their feelings using an eight point Likert Scale that ranges from "not true of me now" (0) to "very true of me now" (7).

The 35 statements were collapsed into the seven stages identified by the manual. A paired t-test was performed for each stage, using an alpha of .01. Results of the analysis are presented in Table 1. For facilitators, t-tests revealed a significant decrease in reported concerns related to Stage 1 – Information, reflecting declining concerns as the mean rating moved toward "not true of me now" for such items as "I have a very limited knowledge about technology." For participants, t-tests revealed significant decreases in reported concerns related to Stages 0 and 3. This reflects

declining concerns as the mean rating moved toward "not true of me now" for such items as "I don't even know what technology is" (Stage 0) and "I am concerned about my inability to manage all that technology requires" (Stage 3).

Table 1.
Reported Stages of Concern – Paired t-tests

	Pretest Mean	Posttest Mean	t-value	p
Facilitators				
Stage 0: Awareness	8.1	5.5	1.89	.091
Stage 1: Information	26.7	22.1	3.21	.011*
Stage 2: Personal	26.0	22.1	2.01	.075
Stage 3: Management	18.5	17.1	.79	.451
Stage 4: Consequence	28.8	27.6	1.35	.211
Stage 5: Collaboration	29.2	30.4	-.69	.507
Stage 6: Refocus	22.2	23.6	-.59	.567
Participants				
Stage 0: Awareness	11.1	6.8	4.30	.000*
Stage 1: Information	25.8	23.3	1.80	.083
Stage 2: Personal	25.7	24.2	1.12	.272
Stage 3: Management	20.1	16.4	3.37	.002*
Stage 4: Consequence	29.1	28.2	1.24	.228
Stage 5: Collaboration	25.2	25.6	-.42	.678
Stage 6: Refocus	21.8	23.2	-1.66	.110

*p<.01

Although there were no other significant changes in levels of concern, Figures 1 and 2 show that while concerns related to Stages 0 through 4 decreased during the project concerns for Stage 5 – Collaboration and Stage 6 – Refocusing increased. This suggests that both facilitators and participants were shifting from an exclusive focus on the impacts of technology itself and toward concerns about maximizing technology's effects" (Stage 5) and modifying the use of technology based on the experiences of students (Stage 6).

Figure 1. Mean Percentile Scores for Facilitators

Teachers' Use of Technology

In order to determine if teacher use of technology changed as a result of participation in the Goals 2000 project, a survey was administered with the SoCQ. Attendees' responses suggest subtle but important shifts toward more use of technology with 70% of the facilitators reporting daily use of technology and nearly half (46.2%) of the participants reporting daily use of technology. When asked which software applications they used, facilitators shifted from 70% reporting never using databases to 60% reporting occasional use. Thirty percent of the facilitators reported never using the Internet with students at the start of the project while 60% reported using it often at the end of the project. For participants, there were important shifts in the use of word processors (42.3% reporting often) and the Internet (from 57% reporting never at the beginning to 26.9% reporting occasional use). When queried about their interactions with their peers related to technology, the participants made few changes. Conversely, for the facilitators, there were changes particularly in the category of "never." Seventy percent of the facilitators reported never working with other teachers to design technology using curriculum before the workshops but only 10% reported never at the end of the project. Fifty percent said they never worked on technical problems related to software with others at the project's beginning while only 10% said never at its conclusion. For the facilitators in particular, these shifts seem consistent with the increased desire to work collaboratively with others expressed above.

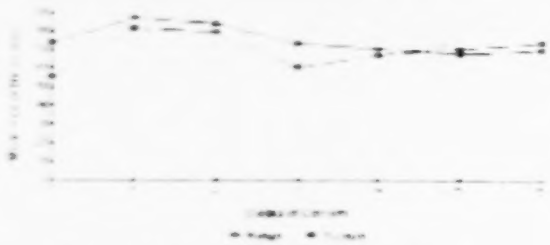

Figure 2. Mean Percentile Scores for Participants

At the completion of the final workshop, an open-ended questionnaire was distributed with the posttest SoCQ and the survey of technology use. The questionnaire asked four questions. The first question asked facilitators and participants what they had learned about technology. Eighty-six percent of the combined group mentioned learning about a variety of software applications, 27% stated that doing/using is knowing, 21% wrote they were less fearful or that technology was less mysterious, 13% mentioned that using technology was fun, and 10% wrote that using trial- and-error and taking chances with technology was important.

The second question asked facilitators and participants what generalizations they could make about teaching and learning with technology based on their experiences during the workshops. Forty-four percent wrote that learning-by-

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doing and exploring instead of lecture and presentation was important. Combining responses for the two groups resulted in forty-two percent stating they now believed that the focus should be on content not on technology and that project-based or problem-based learning was best. Thirty-three percent mentioned the importance of hands-on learning, and 25% wrote about the value of collaboration and learning with a partner. Twenty-three percent defined the role of the teacher as facilitator rather than director. Thirteen percent mentioned that the models used during the workshops could be adapted to their own classroom.

The third question asked facilitators and participants to suggest any changes in the workshop structure they would recommend. Three respondents mentioned providing free lunches, improving the air conditioning, and doing fewer surveys respectively. All of the remaining 45 workshop attendees stated the need for more technology learning workshops. They recommended extending the model to include more teachers and asked for more opportunities for themselves. In addition, thirty-five percent of respondents stated the need for more technology access in their own teaching contexts.

The fourth question asked facilitators and participants what activities they had engaged in with other colleagues. All the participants either left the question blank or wrote "nothing yet." The 60% of the facilitators, on the other hand, stated they had shared ideas with other teachers, and 40% reported they had either presented other workshops or collaboratively designed lessons with colleagues in their own building.

Conclusions

Can six workshop days make a difference in teacher attitudes and uses of technology? The answer is mixed. Looking at the data, it is possible to conclude that the Goals 2000 workshops changed teachers in subtle and emerging ways. The workshops decreased the information concerns of facilitators and the awareness and management concerns of participants. Data suggest that attendees use of technology to support the learning increased. Facilitators, who were placed in the role of teachers of teachers generalized that role and worked with colleagues outside the structure of the Goals 2000 project. Yet, this data points only in the direction of change, not toward substantial or deep changes in educational practices. As the teachers themselves recognized, more is needed – more technology education for teachers and more technology for student use. This project set a process in motion. It demonstrated that a little can go a long way. To fully realize the beginnings of change set in motion by the Goals 2000 project, however, it will take more before hopes for district-wide technology integration become reality.

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